



E-ISSN: 2278-4136  
P-ISSN: 2349-8234  
JPP 2019; SP5: 57-58

Dr. Anupama Kaushik  
Department of Home Science,  
D.D.U Gorakhpur University,  
Gorakhpur, Haryana, India

(Special Issue- 5)

International Conference on

“Food Security through Agriculture & Allied Sciences”

(May 27-29, 2019)

## Effects of developed guava seeds biscuit on blood glucose level of type 2 diabetes patients

Dr. Anupama Kaushik

### Abstract

Diabetes mellitus is one of the most common endocrine diseases & its type 2 is major form of diabetes, accounting for 90% of cases worldwide. Guava fruits are reported to contain several flavonoids, terpenoids & glycosidase compounds that possess anti diabetic properties, as well guava seeds contains dietary fiber which lowers the blood glucose level. So by using seeds along with pulp of guava & flour biscuits were developed. After nutrient analysis and sensory evaluation, the product was fed to diabetic patients for 2 weeks after which their post parandial blood glucose level was assessed & results showed a significant decrease in blood glucose level of diabetic patients.

**Keywords:** Developed, guava, blood, diabetes, patients

### Introduction

Guava (*Psidium guajava*) is a worldwide popular tropical fruit with high content of vitamin C, Fiber & phytochemicals. The traditional therapeutic benefits of guava over metabolic disorders, gut infection, diabetes and obesity have been proven. (Joseph & priya 2011). The prevalence of diabetes is rapidly rising all over the globe at an alarming rate as a major health problem in urban population in India (Huizinga & Rothman 2004) [1].

So the use of starch blockers has recently gained popularity. The treatment of type2 diabetes is complicated by several factors inherent to the disease and elevated post parandial hyperglycemia is one of the risk factor. PPHG is elevated by the action of glucosidase, a class of enzyme that helps in breakdown of carbohydrate into simple sugar. Glucosidase inhibitors such as Alpha-amylase inhibitors play a major role in managing PPHG in diabetic patients (Alarcon et al. 1998).

Guava fruits are reported to contain several flavanoids, terpenoids & glycosidase compounds that possess anti-diabetic properties (Farkes 2002) [5].

So to assess the effects of guava seeds on diabetic patients, guava seed biscuits were developed & effect was studied.

### Methods and Material

Guava seeds along with its internal flesh is dried & grinded to make its flour. By using guava seed flour, refined wheat flour, butter & salt biscuits were prepared. After developing guava seeds flour biscuits sensory evaluation was done. Nutrient analysis was done to assess moisture content fiber content, fat, proteins and energy etc. for developed biscuits.

After development of product its effect was studied on subjects. 50 male & female of type 2 diabetic patients were selected for the study as subjects. Subjects free from added risk factors like hypertension, Thyroid, Kidney disease, secondary alcoholism & chewing tobacco were selected. Before starting the intervention program initial fasting & post parandial blood glucose level were assessed using glucometer. Daily 50gm developed product was given to subject in the morning with breakfast & their daily diet was not altered throughout the study period. The period of intervention was 2 weeks after completion of which fasting glucose level was estimated before ingestion of any food material & post parandial glucose level was estimated 2 hours post lunch.

### Correspondence

Dr. Anupama Kaushik  
Department of Home Science,  
D.D.U Gorakhpur University,  
Gorakhpur, Haryana, India

The data on physiological symptoms experienced by subjects was also gathered by asking them about symptoms such as polydipsia, polyphagia, Polyurea & nocturea in 24 hour presence & frequency of the system was noted before & after intervention. The data was compiled & analyzed statistically for interpretation of results.

## Result and Discussion

**Table 1:** Nutrient percentage of developed guava seed biscuit (Value per 100gm)

Nutrient	Percentage
Moisture	3.2
Ash	0.56
Fat	34.2
Protein	22.2
Carbohydrate	39.84
Fiber	18

**Note:** Nutrient analysis was done in Regional food research analysis centre, Lucknow.

Table 1 refers the nutrient percentage of 100gms of developed guava seed biscuits. Water content (Moisture) was 3.2%, Protein 22.2%, carbohydrate 39.84 %, Fat 34.2 % & total fiber content was 18 %. 100gms biscuit provided 555.96 Kcal energy & percentage of fiber content in developed product was good.

**Table 2:** Effect of developed Guava seed biscuit consumption on fasting blood glucose level of diabetic patients.

Fasting blood Glucose level mg/dl	Initial		After 15 days Supplementation	
	No	%	No	%
160-180	38	76	20	40
140-160	7	14	03	6
120-140	3	6	01	2
100-120	2	4	08	16
80-100	-----	-----	18	36
Total	50	100	50	100

P value - 0.035 Significant at 5 percent level

Effect of developed product on fasting blood sugar level was depicted in Table 2. Fasting sugar level was depicted in table 2. The fasting blood sugar level of Subjects ranges between 80-180 mg/dl. There was a reduction in fasting blood glucose level of the subjects. 36% subjects came in normal range of fasting blood sugar level (less than 100 mg/dl), after supplementation of developed product, while no one was under this range at initial level. There was 36% reduction in blood sugar level of type2 diabetic patients. The above table showed a significant effect of guava seed biscuit on fasting blood sugar level of diabetic patients.

**Table 3:** Effect of developed Guava seed biscuit on Post prandial blood glucose level of subjects.

PP Blood Glucose level mg/dl	Initial		After 15 days Supplementation	
	No	%	No	%
240-220	34	68	11	22
220-200	09	18	05	10
200-180	06	12	07	14
180-140	1	2	13	26
140-120	-----	-----	02	04
120-100	-----	-----	12	24
Total	50	100	50	100

P value 0.024 significant at 5 %.

Effect of developed food product on PPHG is shown in table 3. The initial PPHG was high among 68% subjects. All the subjects were above normal range PP blood sugar level but after supplementation of developed product 24% subjects came under normal range (90-130 mg/dl). Reduction in number of patients of PPHG was observed after developed product supplementation. Findings of the study showed a significant effect of developed product on blood sugar level of subjects.

## Conclusion

Results of the present study showed a positive effect of guava seed biscuit on hyperglycemia of diabetic patients. Leaves, seeds and pulp of fruit have significant proportions of bioactive compounds with beneficial physiological and metabolic properties. Much work has been reported on the biological activity of guava peel, flesh and leaves. On the other hand, little attention has been given to the tons of guava seeds environmental load. Such type of products should be developed from guava seeds which has economical and medicinal use.

## References

- Huizinga MM, Rothman RL. Indian J Med. Res. 2006; 124:481-484.
- Alarcon-Aguilara FJ, Roman-Ramos R, Perez-Gutierrez S, Aguilar Contreas-Weber CC, Flores-Saenz JL. J Ethnopharmacol. 1998; 61(2):101-110.
- Mani UV, Mani IU, Iyer UM, Prakash B, Manivannan T, Campbell S, Chandalia S. Glycemic and Lipomic Response to Various Regional Meals and South Indian Snacks. Int. J Diab. Dev. Countries, 1997, 17.
- Cheng JT, Yang RS. Am. J Chin. Med. 1983; 11:74-76.
- Farkes L. Ethnopharmacol J. 2002; 80:103-107.
- Ravi K, Sathishekhar D, Subramanian S. Biol. Trace Elemss. Res. 2004; 99:145-155.